



# Technical Standard Order

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**Subject: TSO-C15d, AIRCRAFT FABRIC, GRADE A**

a. Applicability.

(1) Minimum Performance Standards. This technical standard order (TSO) prescribes the minimum performance standards that aircraft fabric, grade A, must meet in order to be identified with the applicable TSO marking. Aircraft fabrics, grade A, that are to be so identified and that are manufactured on or after the date of this TSO must meet the standards set forth in Society of Automotive Engineers, Inc. (SAE), Aerospace Material Specification (AMS) Document No. AMS 3806D, "Cloth, Airplane, Cotton, Mercerized 80 lb. (355N) Breaking Strength," dated April 15, 1980, with the exceptions and additions covered in subparagraphs a.(2) and a.(3) respectively of this TSO. Fabric approved prior to the date of this TSO may continue to be manufactured under the provision of this original approval.

(2) Exceptions.

(i) Delete from paragraph 2. of SAE AMS 3806D the following: "the latest issue of Aerospace Material Specifications (AMS) shall apply."

(ii) Compliance with paragraphs 4.2.2.1, 5.2.4, and 8.3 of SAE AMS 3806D is not required.

(3) Additions.

(i) Paragraph 1.1 of SAE AMS 3806D shall read as follows:

Form: This specification covers one strength and one weave of mercerized cotton cloth known as "airplane cloth." However, synthetic fabric material, in particular polyester in the greige condition, also may be identified and used as "airplane cloth" if the fabric is shown to have certain equivalent properties as cotton cloth.

(ii) Paragraph 1.2 of SAE AMS 3806D shall read as follows:

Application. Aircraft with wing loadings 9 pounds per square foot (psf) or greater, and never-exceed speeds of 160 miles per hour (mph) or greater. Primarily for the external covering of aircraft surfaces, such as wings, fuselage, ailerons, elevators, and other airfoil surfaces.

(iii) Replace the word cotton with cotton cloth in paragraph 3.1.1 of SAE AMS 3806D.

(iv) Paragraph 3.1.2 of SAE AMS 3806D shall read as follows:

Yarn: The cloth shall be woven from 2-ply combed cotton yarn or synthetic continuous filament yarn.

(v) Paragraph 3.1.4 of SAE AMS 3806D shall read as follows:

Finishing: The cloth shall be uniformly finished in accordance with the best practice for high grade airplane cloth. Finishing of cotton cloth shall consist of washing, framing, and calendaring. The calendaring shall be sufficient to lay any nap present and shall provide a smooth even surface. Nap may be removed by singeing. Synthetic cloth shall remain unfinished (greige).

(vi) In addition to the requirements of paragraphs 3.2.1, 3.2.2, and 3.2.6 of SAE AMS 3806D, include the following after each title: (cotton cloth only).

(vii) The first sentence of paragraph 3.3 of SAE AMS 3806D shall read as follows:

Quality: The cotton fibers and synthetic filament shall be evenly spun into yarns of proper and uniform yarn count, twist, and diameter to produce the texture and weight required.

(viii) In addition to the requirements of paragraphs 4.6.1, 4.6.2, 5.1, and 5.2.2 of SAE AMS 3806D, replace reference to AMS 3806D with TSO-C15d.

b. Marking. Requirements for marking are specified in paragraph 5.1 of SAE AMS 3806D.

c. Data Requirements.

(1) In addition to the FAR section 21.605, the manufacturer must furnish the manager, aircraft certification office (ACO), Federal Aviation Administration, having geographical purview of the manufacturer's facilities, one copy each of the following technical data:

(i) A complete description of the aircraft cloth including weight, thread count, breaking strength, elongation, and burst strength.

(ii) A report of the test conducted in accordance with SAE AMS 3806D for qualification and approval.

(iii) Quality control test specifications to be used to test each production article to ensure compliance with this TSO.

(2) In addition, the manufacturer must furnish to the user a note with the following statement:

“The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install the article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards, the article may be installed only if further evaluation by the applicant documents an acceptable installation and is approved by the Administrator. In particular, approved polyester fabric must be installed using an approved process specification.”

d. Availability of Reference Documents.

(1) Copies of SAE AMS 3806D and AMS 2350 may be purchased from the Society of Automotive Engineers, Inc., Department 331, 400 Commonwealth Drive, Warrendale, PA 15096.

(2) Copies of ASTM D629, D1682, D3775 and D3776 may be purchased from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

(3) Federal Aviation Regulations, Part 21, Subpart O, and Advisory Circular 20-110, “Index of Aviation Technical Standard Orders,” may be reviewed at FAA Headquarters in the Aircraft Certification Service, Aircraft Engineering Division, (AIR-120), and at all regional ACO’s.

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Certification Service